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EXAMINER

LAFORGIA, CHRISTIAN A

ART UNIT

PAPER NUMBER

2131

DATE MAILED: 06/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/591,080

Applicant(s)

GINSBERG ET AL.

Examiner

Christian La Forgia

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) 37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-36 and 38-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. The amendment filed on 22 March 2004 is noted and made of record.
2. Claims 1 through 54 are presented for examination.
3. Claim 37 has been cancelled as per Applicant's request.

Response to Arguments

4. Applicant's arguments filed 22 March 2004 have been fully considered but they are not persuasive.

5. With regards to the Applicant's arguments that the time stamp in the response packet shows its time of transmission, not the time of transmission of the ping packet, the Examiner disagrees. Link clearly states in the abstract that:

...a first client places first time information such as a timestamp into a (ping) data packet and sends the packet to the second client, who places second time information into the packet, and sends the packet as a response packet back to the first client. The first client determines latency based on its current time and the first time information returned in the response packet.

Therefore, the response packet includes the timestamp of the ping packet in addition to the timestamp of the transmission of the response packet. Thus, the first client can determine the network latency with regards to itself. Furthermore, as the Applicant points out on page 24 of the Amendment filed on 22 March 2004, the response-response packet contains the timestamp of the response packet, so that the second client can determine the time of a round trip with respect to itself. Therefore, the timestamp of the initial transmission from a client is returned in the response packet so that the respective client can determine the round trip time with respect to the timestamp of its initial transmission.

6. The Examiner agrees with the Applicant that Link offers no disclosure, teaching, or suggestion of setting a transmission time of an outgoing data packet to be the transmission time

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of an incoming packet. As stated above, Link does teach including the timestamp of the incoming data packet in the outgoing data packet. The Examiner contends it would have been obvious to one ordinary skill in the art at the time the invention was made to set the timestamp of the outgoing data packet to the timestamp of the incoming packet, since it has been held that shifting or rearranging the location of a part of an invention requires only routine skill in the art. See *In re Japikse*, 181 F.2d 1019, 1023, 86 USPQ 70, 73 (CCPA 1050); see MPEP § 2144.04. Thus it would have only involved routine skill in the art to assign the timestamp of the outgoing data packet to that of the incoming data packet's timestamp.

7. With regards to the Applicant's arguments that Link does not disclose a data validity portion for validating the incoming data packet, the Examiner disagrees. The Applicant is correct in pointing out that the Examiner cites figures 1, block 53 and 5, block 80a, in addition to column 4, lines 4-31 and column 6, lines 19-33 as to the teaching of a data validity portion for validating incoming data packets. The cited sections of Link point to a network interface card, otherwise known as a NIC. Network interface cards are used to validate incoming data packets, examples of this can be seen in at least U.S. Patent Nos. 6,141,705 and 6,370,599, therefore Link discloses a data validity portion (in this case the NIC) for validating incoming data packets.

8. The Examiner agrees that Link does not use the terms field programmable gate array, otherwise known as FPGA, but disagrees with the Applicant's allegation that they are not a part of the Link invention. U.S. Patent Nos. 6,721,872 and 6,064,649 provide at least two examples of field programmable gate arrays being used in network interface cards, a well-known and common practice in the art. Therefore Link discloses various portions are located within field-

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programmable gate arrays by disclosing the use of computer add-in cards, specifically a network interface card in this case.

9. The Applicant's objection to the non-patent literature has been noted, and the Examiner apologizes for the oversight. "Internetworking with TCP/IP Principles, Protocols, and Architectures" by Douglas E. Comer has a copyright date of 1995, "Computer Networks 3rd Edition" by Andrew Tanenbaum has a copyright date of 1996, and "TCP/IP Illustrated, Volume 1" by W. Richard Stevens has a copyright date of 1994. All of the copyright dates precede the Applicant's filing date of 09 June 1999.

10. The Examiner disagrees with the Applicant's assertion that Link's teaching of the use of UDP packets can be taken as a teaching away from TCP packets. After a lengthy review of the cited prior art, the Examiner failed to notice any negative limitation excluding the use of TCP packets. In addition, Link does not list any benefits of using UDP over TCP. The four factual inquires enunciated in *Graham v. John Deere Co.* as a background for determining obviousness are as follows:

- (A) Determining the scope and contents of the prior art;
- (B) Ascertaining the differences between the prior art and the claims in issue;
- (C) Resolving the level of ordinary skill in the pertinent art; and
- (D) Evaluating evidence of secondary considerations.

The Examiner has considered the scope and contents of the prior art. The Examiner has pointed out the differences between the prior art and the claims in issue, and in this case the prior art uses UDP packets, while the claims in issue pertain to TCP packets. As the Applicant points out on page 27 of the Amendment filed on 22 March 2004, TCP packets were available to Link at the time the invention was made. The applicant poses the obvious question of why did Link chose UDP instead of TCP, and further goes onto speculate that Link believed UDP was better than

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TCP. At this point, the mere fact that Link chose to use UDP over TCP can only be regarded as a design choice by Link. In addition, the Examiner believes UDP and TCP to be art-recognized equivalents. According to MPEP § 2144.06, in order to establish equivalence as a rationale supporting an obviousness rejection, the equivalency must be recognized in the prior art and not based on the Applicant's disclosure. In this particular instance, there is sufficient evidence, as well as an admission by the Applicant that TCP was available at the time the invention of Link was made, in the prior art that both UDP and TCP are well known Transport Layer protocols in the art of transporting data over a network. Furthermore, the Applicant has failed to provide any evidence of secondary considerations, such as unexpected results, commercial success, long-felt need, failure of others, copying by others, licensing, and skepticism of experts, of the benefits of using TCP over UDP or vice versa.

11. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

12. With regards to the Applicant's assertion that Link would not have included inserting the first TCP destination port as a second TCP source port in the second data packet and inserting the first TCP source port as a second TCP destination port in the second data packet, the Examiner respectfully disagrees. As shown above, the Examiner has proven a prima facie case

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of obviousness for using TCP instead of UDP. As such, the source and destination ports are an inherent feature of the TCP protocol. Therefore, if one is using TCP as a transport protocol, each packet would include a source and destination port, see Figure 13.7 on page 221 of

“Internetworking with TCP/IP Principles, Protocols, and Architectures” by Douglas E. Comer.

Thus, the response packet would have to insert the first TCP destination port as a second TCP source port in the second data packet and inserting the first TCP source port as a second TCP destination port in the second data packet.

13. Regarding the Applicant’s allegations that Link does not teach checksums or TCP flags, the Examiner agrees. As shown above the Examiner has established a prima facie case of obviousness for using TCP instead of UDP. The Examiner contends that the Applicant is claiming features inherent to TCP and cites various sections of “Internetworking with TCP/IP Principles, Protocols, and Architectures” by Douglas E. Comer. Thus, if TCP is being used, checksums and TCP flags become a part of the data packet header as seen in the cited sections of “Internetworking with TCP/IP Principles, Protocols, and Architectures” by Douglas E. Comer below.

14. See further rejections that follow.

Claim Rejections - 35 USC § 103

15. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

16. Claims 1-29, 31-36, and 38-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Link.

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17. As per claim 1, Link teaches a method of determining a time delay for a round-trip transmission of data comprising:

receiving a first data packet comprising a first IP source address, a first IP destination address, a first TCP source port, a first TCP destination port, and a first time stamp indicating a first time when the first data packet was transmitted (Figures 4 [block 402], 6, 7a, 9 [block 902]; column 5, lines 20-25; column 6, lines 53-65);

inserting the first IP destination address as a second IP source address in a second data packet (Figures 7b, 9 [block 904]; column 5, lines 20-25; column 7, lines 4-13);

inserting the first IP source address as a second IP destination address in the second data packet (Figures 7b, 9 [block 904]; column 5, lines 20-25; column 7, lines 4-13);

inserting the first TCP destination port as a second TCP source port in the second data packet (Figures 5 [block 80a], 7b, 9 [block 904]; column 4, lines 57-65; column 6, lines 22-33; column 7, lines 4-13);

inserting the first TCP source port as a second TCP destination port in the second data packet (Figures 5 [block 80a], 7b, 9 [block 904]; column 4, lines 57-65; column 6, lines 22-33; column 7, lines 4-13);

inserting the first time stamp as a second time stamp in the second data packet, wherein the second time stamp is for indicating a second time when the second data packet is transmitted (Figures 7b [block 84f], 9 [block 910]; column 5, lines 20-25; column 7, lines 20-25); and

transmitting the second data packet (Figures 4 [block 402], 7b [block 84], 9 [blocks 902, 910]; column 7, lines 14-19). Link does not teach using TCP (transmission control protocol). Link teaches using UDP (user datagram protocol). TCP and UDP are both Transport Layer

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protocols of the OSI model, and therefore have many similarities. The major difference between UDP and TCP is that UDP is connectionless-oriented while TCP is connection-oriented. A connection-oriented protocol verifies that every packet of data that is sent via the network is received at the client side. For more information on UDP and TCP please refer to Chapters 12 and 13, respectively, of **Internetworking with TCP/IP Principles, Protocols, and Architectures** by Douglas E. Comer. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use TCP instead of UDP in order to create a more reliable method of determining roundtrip latency. In addition, the Examiner believes UDP and TCP to be art-recognized equivalents. According to MPEP § 2144.06, in order to establish equivalence as a rationale supporting an obviousness rejection, the equivalency must be recognized in the prior art and not based on the Applicant's disclosure. In this particular instance, there is sufficient evidence, as well as an admission by the Applicant that TCP was available at the time the invention of Link was made, in the prior art that both UDP and TCP are well known Transport Layer protocols in the art of transporting data over a network. Furthermore, the Applicant has failed to provide any evidence of secondary considerations, such as unexpected results, commercial success, long-felt need, failure of others, copying by others, licensing, and skepticism of experts, of the benefits of using TCP over UDP or vice versa. It would have been obvious to one of ordinary skill in the art at the time the invention was made to set the timestamp of the outgoing data packet to the timestamp of the incoming packet, since it has been held that shifting or rearranging the location of a part of an invention requires only routine skill in the art. See *In re Japikse*, 181 F.2d 1019, 1023, 86 USPQ 70, 73 (CCPA 1050);

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see MPEP § 2144.04. Thus it would have only involved routine skill in the art to assign the timestamp of the outgoing data packet to that of the incoming data packet's timestamp.

18. Regarding claims 2, 40, and 47, Link teaches further comprising:

transmitting the first data packet at the first time (Figures 6 [block 82f], 7a [block 82f]; column 6, lines 19-53);

receiving the second data packet at a second time (Figures 7b [block 84f], 9 [blocks 902, 910]; column 7, lines 14-25); and

determining a difference between the first time in the second time stamp and the second time to establish the time delay for the round-trip transmission of data (Figure 9 [block 912]; column 7, lines 14-33).

19. Regarding claim 3, Link teaches further comprising:

validating the first IP destination address while receiving the first data packet, before inserting the first IP destination address, before inserting the first IP source address, before inserting the first TCP destination port, before inserting the first TCP source port, and before transmitting the second data packet (Figures 2 [block 70], 3, 8 [block 802], 9 [block 922]; column 4, line 66 to column 5, line 12; column 6, lines 34-53); and

validating the first TCP destination port while receiving the first data packet, before inserting the first IP destination address, before inserting the first IP source address, before inserting the first TCP destination port, before inserting the first TCP source port, and before transmitting the second data packet (Figures 2 [block 70], 3, 8 [block 802], 9 [block 922];

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column 4, line 66 to column 5, line 12; column 6, lines 34-53). Link teaches keeping a record of IP addresses a client communicates with. It would be obvious to one of ordinary skill in the art at the time the invention was made to also keep track of the TCP destination port as it is typically needed in a TCP/IP transmission, see *Section 13.7 Ports, Connections, and Endpoints*, which begins on page 216 and ends on page 218, of *Internetworking with TCP/IP Principles, Protocols, and Architectures* by Douglas E. Comer.

20. Regarding claims 4, 5, 6, 12 and 23, Link teaches wherein:

inserting the first IP destination address occurs while transmitting the second data packet (Figures 7b, 9 [block 904]; column 5, lines 20-25; column 7, lines 4-13);

inserting the first IP source address occurs while transmitting the second data packet (Figures 7b, 9 [block 904]; column 5, lines 20-25; column 7, lines 4-13);

inserting the first TCP destination port occurs while transmitting the second data packet (Figures 5 [block 80a], 7b, 9 [block 904]; column 4, lines 57-65; column 6, lines 22-33; column 7, lines 4-13);

inserting the first TCP source port occurs while transmitting the second data packet (Figures 5 [block 80a], 7b, 9 [block 904]; column 4, lines 57-65; column 6, lines 22-33; column 7, lines 4-13); and

inserting the first time stamp occurs while transmitting the second data packet (Figures 7b [block 84f], 9 [block 910]; column 5, lines 20-25; column 7, lines 20-25). Link does not teach using TCP (transmission control protocol). Link teaches using UDP (user datagram protocol). TCP and UDP are both Transport Layer protocols of the OSI model, and therefore

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have many similarities. The major difference between UDP and TCP is that UDP is connectionless-oriented while TCP is connection-oriented. A connection-oriented protocol verifies that every packet of data that is sent via the network is received at the client side. For more information on UDP and TCP please refer to Chapters 12 and 13, respectively, of **Internetworking with TCP/IP Principles, Protocols, and Architectures** by Douglas E. Comer. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use TCP instead of UDP in order to create a more reliable method of determining roundtrip latency.

21. Regarding claim 7, Link teaches further comprising:

providing the first data packet to further comprise a first IP checksum, a first TCP checksum, and a first CRC checksum (Figures 6, 7a, 7b, 7c; column 6, lines 19-33);

validating the first IP checksum while receiving the first data packet (Figures 6, 7a, 7b, 7c; column 6, lines 19-33);

validating the first TCP checksum while receiving the first data packet (Figures 6, 7a, 7b, 7c; column 6, lines 19-33); and

validating the first CRC checksum (Figures 6, 7a, 7b, 7c; column 6, lines 19-33).

22. With regards to claim 8, Link teaches further comprising:

storing the first IP source address and the first IP destination address before validating the first IP checksum (Figures 2 [block 70], 3, 8 [block 802], 9 [block 922]; column 4, line 66 to column 5, line 12; column 6, lines 34-53); and

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storing the first TCP source port and the first TCP destination port after validating the first IP checksum and before validating the first TCP checksum (Figures 2 [block 70], 3, 8 [block 802], 9 [block 922]; column 4, line 66 to column 5, line 12; column 6, lines 34-53). Link teaches keeping a record of IP addresses a client communicates with. It would be obvious to one of ordinary skill in the art at the time the invention was made to also keep track of the TCP destination port as it is typically needed in a TCP/IP transmission, see ***Section 13.7 Ports, Connections, and Endpoints***, which begins on page 216 and ends on page 218, of ***Internetworking with TCP/IP Principles, Protocols, and Architectures*** by Douglas E. Comer.

23. With regards to claim 9, Link teaches wherein:

validating the first TCP checksum occurs after validating the first IP checksum and before validating the first CRC checksum (Figures 6, 7a, 7b, 7c; column 6, lines 19-33).

24. With regards to claim 10, Link teaches wherein:

validating the first CRC checksum occurs after receiving the first data packet (Figures 6, 7a, 7b, 7c; column 6, lines 19-33).

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25. With regards to claim 11, Link teaches further comprising:

determining a second IP checksum for the second data packet (Figures 6, 7a, 7b, 7c; column 6, lines 19-33);

inserting the second IP checksum into the second data packet while transmitting the second data packet (Figures 6, 7a, 7b, 7c; column 6, lines 19-33);

determining a second TCP checksum for the second data packet (Figures 6, 7a, 7b, 7c; column 6, lines 19-33); and

inserting the second TCP checksum into the second data packet while transmitting the second data packet (Figures 6, 7a, 7b, 7c; column 6, lines 19-33).

26. Regarding claim 13, Link teaches wherein:

inserting the first IP destination address occurs after inserting the second IP checksum (Figures 7b, 9 [block 904]; column 5, lines 20-25; column 7, lines 4-13);

inserting the first IP source address occurs after inserting the first IP destination address (Figures 7b, 9 [block 904]; column 5, lines 20-25; column 7, lines 4-13);

inserting the first TCP destination port occurs after inserting the first IP source address (Figures 5 [block 80a], 7b, 9 [block 904]; column 4, lines 57-65; column 6, lines 22-33; column 7, lines 4-13); and

inserting the first TCP source port occurs after inserting the first TCP destination port and before inserting the second TCP checksum (Figures 5 [block 80a], 7b, 9 [block 904]; column 4, lines 57-65; column 6, lines 22-33; column 7, lines 4-13). Link does not teach using TCP (transmission control protocol). Link teaches using UDP (user datagram protocol). TCP and

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UDP are both Transport Layer protocols of the OSI model, and therefore have many similarities. The major difference between UDP and TCP is that UDP is connectionless-oriented while TCP is connection-oriented. A connection-oriented protocol verifies that every packet of data that is sent via the network is received at the client side. For more information on UDP and TCP please refer to Chapters 12 and 13, respectively, of **Internetworking with TCP/IP Principles, Protocols, and Architectures** by Douglas E. Comer. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use TCP instead of UDP in order to create a more reliable method of determining roundtrip latency.

27. Regarding claims 14, 25, 28, 43, and 51, Link teaches further comprising:

providing the first data packet to further comprise a first data pattern (Figures 5, 6, 7a; column 6, lines 19-33); and

inserting a second data pattern into the second data packet (Figure 7b, 9 [block 904]; column 6, lines 19-33; column 7, lines 14-33).

28. Regarding claims 15, 44, and 52, Link teaches wherein:

inserting the second data pattern occurs while transmitting the second data packet (Figure 7b, 9 [block 904]; column 6, lines 19-33; column 7, lines 14-33).

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29. Regarding claim 16, Link teaches further comprising:

providing the first data packet to further comprise a first TCP flag (Figures 5 [block 80a], 7a; column 6, lines 19-33); and

inserting the first TCP flag as a second TCP flag into the second data packet (Figures 5 [block 80a], 7b; column 6, lines 19-33).

30. Regarding claim 17, Link teaches further comprising:

validating the first TCP flag while receiving the first data packet, before inserting the first IP destination address, before inserting the first IP source address, before inserting the first TCP destination port, before inserting the first TCP source port, before transmitting the second data packet, and before inserting the first TCP flag (Figures 5 [block 80a], 7a; column 6, lines 19-33).

31. Regarding claim 18, Link teaches wherein:

inserting the second TCP flag occurs while transmitting the second data packet (Figures 5 [block 80a], 7a; column 6, lines 19-33).

32. Regarding claims 19 and 20, Link teaches further comprising:

providing the first data packet to further comprise two TCP flags (Figures 5 [block 80a], 7a; column 6, lines 19-33);

inserting the two TCP flags into the second data packet (Figures 5 [block 80a], 7a; column 6, lines 19-33);

inserting an additional TCP flag into the second data packet, the additional TCP flag having a value of one (Figures 5 [block 80a], 7a; column 6, lines 19-33); and

inserting three additional TCP flags into the second data packet, the three additional TCP flags each having a value of zero (Figures 5 [block 80a], 7a; column 6, lines 19-33). It would have been obvious to one of ordinary skill in the art at the time the invention was made to set the PSH flag in the TCP header. One would be motivated to set the push flag as a notification from the sender to the receiver for the receiver to pass all the data that is has to the receiving process.

33. With regards to claim 21, Link teaches further comprising:

providing a FIN flag and a SYN flag for the two of the six TCP flags (Figures 5 [block 80a], 7a; column 6, lines 19-33); and

providing an ACK flag for the additional TCP flag (Figures 5 [block 80a], 7a; column 6, lines 19-33). The FIN, SYN, and ACK flags are all inherent to a TCP header, as seen on page 222 of *Internetworking with TCP/IP Principles, Protocols, and Architectures* by Douglas E. Comer.

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34. Regarding claim 22, Link teaches further comprising:

providing the first data packet to further comprise a first IP checksum, first TCP flags, a first TCP checksum, and a first CRC checksum (Figures 5 [block 80a], 6, 7a, 7b, 7c; column 6, lines 19-33);

validating the first IP checksum while receiving the first data packet (Figures 6, 7a, 7b, 7c; column 6, lines 19-33);

validating the first TCP checksum while receiving the first data packet (Figures 6, 7a, 7b, 7c; column 6, lines 19-33);

validating the first CRC checksum after receiving the first data packet (Figures 6, 7a, 7b, 7c; column 6, lines 19-33);

determining a second IP checksum for the second data packet (Figures 6, 7a, 7b, 7c; column 6, lines 19-33);

inserting and the second IP checksum into the second data packet while transmitting the second data packet (Figures 6, 7a, 7b, 7c; column 6, lines 19-33);

inserting the first TCP flags as second TCP flags into the second data packet while transmitting the second data packet (Figures 5 [block 80a], 7b; column 6, lines 19-33);

determining a second TCP checksum for the second data packet (Figures 6, 7a, 7b, 7c; column 6, lines 19-33);

inserting the second TCP checksum into the second data packet while transmitting the second data packet (Figures 6, 7a, 7b, 7c; column 6, lines 19-33);

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determining a second CRC checksum for the second data packet (Figures 6, 7a, 7b, 7c; column 6, lines 19-33); and

inserting the second CRC checksum into the second data packet while transmitting the second data packet (Figures 6, 7a, 7b, 7c; column 6, lines 19-33).

35. With regards to claims 24 and 27, Link teaches wherein:

inserting the first IP destination address occurs after inserting the second IP checksum (Figures 7b, 9 [block 904]; column 5, lines 20-25; column 7, lines 4-13);

inserting the first IP source address occurs after inserting the first IP destination address (Figures 7b, 9 [block 904]; column 5, lines 20-25; column 7, lines 4-13);

inserting the first TCP destination port occurs after inserting the first IP source address (Figures 5 [block 80a], 7b, 9 [block 904]; column 4, lines 57-65; column 6, lines 22-33; column 7, lines 4-13);

inserting the first TCP source port occurs after inserting the first TCP destination port (Figures 5 [block 80a], 7b, 9 [block 904]; column 4, lines 57-65; column 6, lines 22-33; column 7, lines 4-13);

inserting the first TCP flags occurs after inserting the first TCP source port (Figures 5 [block 80a], 7b; column 6, lines 19-33);

inserting the second TCP checksum occurs after inserting the first TCP flags (Figures 6, 7a, 7b, 7c; column 6, lines 19-33);

inserting the first time stamp occur after inserting the second TCP checksum (Figures 7b [block 84f], 9 [block 910]; column 5, lines 20-25; column 7, lines 20-25); and

inserting the second CRC checksum occurs after inserting the first time stamp (Figures 6, 7a, 7b, 7c; column 6, lines 19-33).

36. With regards to claims 26 and 29, Link teaches further comprising:

transmitting the first data packet at the first time from a first electronic apparatus having the first IP source address and the first TCP source port (Figures 4 [block 400], 7a, 9; column 5, lines 15-20);

receiving the second data packet at a second time and at the first electronic apparatus having the second IP destination address and the second TCP destination port (Figures 4 [block 404], 7b, 9; column 5, lines 25-29); and

subtracting the first time in the second time stamp from the second time to determine the time delay for the round-trip transmission of data (Figure 9 [block 912]; column 7, lines 14-33), wherein:

receiving the first data packet further comprises receiving the first data packet at a second electronic apparatus having the first IP destination address and the first TCP destination port (Figures 4 [block 402], 7a, 7b; column 5, lines 20-25); and

transmitting the second data packet further comprises transmitting the second data packet from the second electronic apparatus having the second IP source address and the second TCP source port (Figures 4 [block 402], 7a, 7b; column 5, lines 20-25).

37. As per claim 31, Link teaches an electronic apparatus for determining a time delay for a round-trip transmission of data comprising:

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an output memory portion coupled to the input memory portion and the second memory and data transfer management portion, the incoming data packet having a first source value for identifying a source of the incoming data packet, a first destination value for identifying a destination for the incoming data packet, and a first time stamp for indicating a time of transmission of the incoming data packet (Figures 1 [block 53], 5 [block 80a], 6 [block 82f], 7a [block 82f]; column 3, lines 15-52; column 4, lines 17-31; column 6, lines 19-33);

a data pattern management portion for managing an insertion of a data pattern into an outgoing data packet, the outgoing data packet having a second source value for identifying a source of the outgoing data packet, a second destination value for identifying a destination for the outgoing data packet, and a second time stamp for indicating a time of transmission of the outgoing data packet, the data pattern management portion for managing the insertion of a data pattern into the outgoing packet by (Figure 1 [block 53]; column 3, lines 15-52; column 4, lines 17-31)

setting the second source value to be the first destination value (Figure 7b; column 7, lines 4-33);

setting the second destination value to be the first source value (Figure 7b; column 7, lines 4-33);

a header format portion for inserting the second value, the second destination value and the second time stamp into the outgoing data packet (Figures 5 [block 80a]; column 6, lines 19-33).

38. Link does not teach setting the second time stamp to be the first time stamp. It would have been obvious to one ordinary skill in the art at the time the invention was made to set the

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timestamp of the outgoing data packet to the timestamp of the incoming packet, since it has been held that shifting or rearranging the location of a part of an invention requires only routine skill in the art. See *In re Japikse*, 181 F.2d 1019, 1023, 86 USPQ 70, 73 (CCPA 1050); see MPEP § 2144.04. Thus it would have only involved routine skill in the art to assign the timestamp of the outgoing data packet to that of the incoming data packet's timestamp.

39. With regards to claim 32, Link teaches further comprising:

an incoming data portion comprising:

a data reception portion for receiving the incoming data packet (Figure 1 [blocks 53]; column 4, lines 4-31);

an input memory portion for storing a portion of an incoming data packet (Figure 1 [blocks 53]; column 4, lines 4-31);

a data validity portion for validating the incoming data packet (Figure 1 [blocks 53], 5 [block 80a]; column 4, lines 4-31; column 6, lines 19-33); and

an outgoing data portion comprising:

the output memory portion (Figure 1 [blocks 53]; column 4, lines 4-31);

the data pattern management portion (Figures 1 [blocks 53], 5 [block 80a]; column 4, lines 4-31; ; column 6, lines 19-33);

the header format portion (Figures 1 [blocks 53], 5 [block 80a]; column 4, lines 4-31; column 6, lines 19-33); and

a data transmission portion for transmitting the outgoing data packet (Figure 1 [blocks 53]; column 4, lines 4-31).

40. With regards to claim 33, Link teaches wherein:

the first source value comprises a TCP source port for the incoming data packet (Figures 5 [block 80a], 7a, 9 [block 904]; column 4, lines 57-65; column 6, lines 22-33; column 7, lines 4-13);

the first destination value comprises a TCP destination port for the incoming data packet (Figures 5 [block 80a], 7a, 9 [block 904]; column 4, lines 57-65; column 6, lines 22-33; column 7, lines 4-13);

the second source value comprises a TCP source port for the outgoing data packet (Figures 5 [block 80a], 7b, 9 [block 904]; column 4, lines 57-65; column 6, lines 22-33; column 7, lines 4-13);

the second destination value comprises a TCP destination port for the outgoing data packet (Figures 5 [block 80a], 7b, 9 [block 904]; column 4, lines 57-65; column 6, lines 22-33; column 7, lines 4-13). Link does not teach using TCP (transmission control protocol). Link teaches using UDP (user datagram protocol). TCP and UDP are both Transport Layer protocols of the OSI model, and therefore have many similarities. The major difference between UDP and TCP is that UDP is connectionless-oriented while TCP is connection-oriented. A connection-oriented protocol verifies that every packet of data that is sent via the network is received at the client side. For more information on UDP and TCP please refer to Chapters 12 and 13, respectively, of **Internetworking with TCP/IP Principles, Protocols, and Architectures** by Douglas E. Comer. Therefore, it would have been obvious to one of ordinary skill in the art at

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the time the invention was made to use TCP instead of UDP in order to create a more reliable method of determining roundtrip latency.

41. With regards to claims 34 and 54, Link teaches wherein:

the input memory portion, the output memory portion, the header format portion, and the data pattern management portion are located within a field-programmable gate array (Figure 1 [blocks 53]; column 4, lines 4-31).

42. With regards to claim 35, Link teaches wherein the data pattern management portion if further for

selecting a first set of TCP flags from the incoming data packet (Figures 5 [block 80a], 7a; column 6, lines 19-33);

setting a second set of TCP flags to be the first set of TCP flags (Figures 5 [block 80a], 7a; column 6, lines 19-33);

the header format is further for inserting the second set of TCP flags into the outgoing data packet (Figures 5 [block 80a], 7a; column 6, lines 19-33). It would have been obvious to one of ordinary skill in the art at the time the invention was made to set a flag in the TCP header. One would be motivated to set a flag as an example of a notification such as urgency, the transmission was received, or the transmission is over.

43. Regarding claim 36, Link teaches wherein:

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the first source value comprises an IP source address for the incoming data packet (Figures 5 [block 80a], 7a, 9 [block 904]; column 4, lines 57-65; column 6, lines 22-33; column 7, lines 4-13);

the first destination value comprises an IP destination address for the incoming data packet (Figures 5 [block 80a], 7a, 9 [block 904]; column 4, lines 57-65; column 6, lines 22-33; column 7, lines 4-13);

the second source value comprises an IP source address for the outgoing data packet (Figures 5 [block 80a], 7b, 9 [block 904]; column 4, lines 57-65; column 6, lines 22-33; column 7, lines 4-13);

the second destination value comprises an IP destination address for the outgoing data packet (Figures 5 [block 80a], 7b, 9 [block 904]; column 4, lines 57-65; column 6, lines 22-33; column 7, lines 4-13).

44. As per claim 38, Link teaches a method of determining a time delay for a round-trip transmission of data comprising:

receiving a first data packet, the first data packet comprising:

a first source value (Figures 5a [block 80a], 6, 7a; column 6, lines 19-33);

a first destination value (Figures 5a [block 80a], 6, 7a; column 6, lines 19-33);

a first time stamp indicating a first time when the first data packet was transmitted

preparing a second data packet (Figures 6 [block 82f], 7a [block 82f]; column 6, lines 19-33), the second data packet comprising:

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a second source value (Figures 5a [block 80a], 6, 7b; column 6, lines 19-33; column 7, lines 4-33);

a second destination value (Figures 5a [block 80a], 6, 7b; column 6, lines 19-33; column 7, lines 4-33);

a second time stamp for indicating a second time when the second data packet is transmitted (Figure 7b [block 84f]; column 7, lines 4-33);

setting the first destination value as the second source value in the second data packet setting the first source value as the second destination value in the second data packet (Figure 7b [block 84f]; column 7, lines 4-33). Link does not teach setting the second timestamp to be the first timestamp. It would have been obvious to one ordinary skill in the art at the time the invention was made to set the timestamp of the outgoing data packet to the timestamp of the incoming packet, since it has been held that shifting or rearranging the location of a part of an invention requires only routine skill in the art. See *In re Japikse*, 181 F.2d 1019, 1023, 86 USPQ 70, 73 (CCPA 1050); see MPEP § 2144.04. Thus it would have only involved routine skill in the art to assign the timestamp of the outgoing data packet to that of the incoming data packet's timestamp.

45. Regarding claims 39 and 48, Link teaches further comprising validating the first destination value before inserting the first destination value, before inserting the first source value, and before transmitting the second data packet (Figures 2 [block 70], 3, 8 [block 802], 9 [block 922]; column 4, line 66 to column 5, line 12; column 6, lines 34-53)

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46. Regarding claims 41 and 49, Link teaches wherein

inserting the first destination value occurs while transmitting the second data packet

(Figures 7b, 9 [block 904]; column 5, lines 20-25; column 7, lines 4-13);

inserting the first source value occurs while transmitting the second data packet (Figures

7b, 9 [block 904]; column 5, lines 20-25; column 7, lines 4-13).

47. Regarding claims 42 and 50, Link teaches wherein inserting the first time stamp occurs

while transmitting the second data packet (Figures 7b [block 84f], 9 [block 910]; column 5, lines

20-25; column 7, lines 20-25).

48. Regarding claims 45 and 53, Link teaches wherein in the providing step, the first data

packet further comprises a first TCP flag, the method further comprising inserting the first TCP

flag as a second TCP flag into the second data packet (Figures 5 [block 80a], 7a; column 6, lines

19-33).

49. As per claim 46, Link teaches an apparatus for determining a time delay for a round-trip

transmission of data comprising:

means for receiving a first data packet, the first data packet comprising:

a first source value (Figures 5a [block 80a], 6, 7a; column 6, lines 19-33);

a first destination value (Figures 5a [block 80a], 6, 7a; column 6, lines 19-33);

a first time stamp indicating a first time when the first data packet was transmitted

(Figures 6 [block 82f], 7a [block 82f]; column 6, lines 19-33);

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means for preparing a second data packet comprising a second source value, a second destination value, a second time stamp for indicating a second time when the second data packet is transmitted (Figures 5a [block 80a], 6, 7b; column 6, lines 19-33; column 7, lines 4-33);

means for inserting the first destination value as the second source value in the second data packet (Figures 7b, 9 [block 904]; column 5, lines 20-25; column 7, lines 4-13);

means for inserting the first source value as the second destination value in the second data packet (Figures 7b, 9 [block 904]; column 5, lines 20-25; column 7, lines 4-13);

means for transmitting the second data packet (Figures 4 [block 402], 7b [block 84], 9 [blocks 902, 910]; column 7, lines 14-19).

50. Link does not teach means for inserting the first time stamp as the second time stamp in the second data packet. It would have been obvious to one ordinary skill in the art at the time the invention was made to set the timestamp of the outgoing data packet to the timestamp of the incoming packet, since it has been held that shifting or rearranging the location of a part of an invention requires only routine skill in the art. See *In re Japikse*, 181 F.2d 1019, 1023, 86 USPQ 70, 73 (CCPA 1050); see MPEP § 2144.04. Thus it would have only involved routine skill in the art to assign the timestamp of the outgoing data packet to that of the incoming data packet's timestamp.

51. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Link in view of U.S. Patent No. 6,321,264 to Fletcher et al., hereinafter Fletcher.

52. Regarding claim 30, Link teaches further comprising:

waiting for the first data packet (Figure 9 [block 900]; column 6, lines 53-65);

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checking a validity of the first data packet (column 6, lines 62-65).

53. Link does not teach:

checking a status of a first memory portion;

storing a portion of the first data packet if the first memory portion is available, the portion of the first memory portion comprising the first IP source address, the first IP destination address, the first TCP source port, and the first TCP destination port;

setting the status of the first memory portion to full if the first data packet is valid;

checking a status of a second memory portion;

transferring the portion of the first data packet from the first memory portion to the second memory portion if the second memory portion is available and if the first data packet is valid;

setting the status of the second memory portion to full; and

setting the status of the first memory portion to empty.

54. Fletcher teaches:

checking a status of a first memory portion (Figures 3 [blocks 390, 395], 5 [block 525], 7 [block 730]; column 8, lines 1-63; column 10, line 57-64; column 11, lines 31-67);

storing a portion of the first data packet if the first memory portion is available, the portion of the first memory portion comprising the first IP source address, the first IP destination address, the first TCP source port, and the first TCP destination port (Figures 3 [blocks 390, 395], 5 [block 525], 7 [block 730]; column 8, lines 1-63; column 10, line 57-64; column 11, lines 31-67);

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setting the status of the first memory portion to full if the first data packet is valid (Figures 3 [blocks 390, 395], 5 [block 525], 7 [block 730]; column 8, lines 1-63; column 10, line 57-64; column 11, lines 31-67);

checking a status of a second memory portion (Figures 3 [blocks 390, 395], 5 [block 525], 7 [block 730]; column 8, lines 1-63; column 10, line 57-64; column 11, lines 31-67);

transferring the portion of the first data packet from the first memory portion to the second memory portion if the second memory portion is available and if the first data packet is valid (Figures 3 [blocks 390, 395], 5 [block 525], 7 [block 730]; column 8, lines 1-63; column 10, line 57-64; column 11, lines 31-67);

setting the status of the second memory portion to full (Figures 3 [blocks 390, 395], 5 [block 525], 7 [block 730]; column 8, lines 1-63; column 10, line 57-64; column 11, lines 31-67); and

setting the status of the first memory portion to empty (Figures 3 [blocks 390, 395], 5 [block 525], 7 [block 730]; column 8, lines 1-63; column 10, line 57-64; column 11, lines 31-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide for checking the memory before writing. One would be motivated to perform the memory checks as to prevent overwriting data.

Conclusion

55. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

56. The following patents are cited to further show the state of the art with respect to round trip latency, such as:

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United States Patent No. 6,141,705 to Anand et al., which is cited to show several properties of a NIC.

United States Patent No. 6,118,765 to Phillips, which is cited to show a discriminator, which determines whether a data packet is a valid packet, a valid apparent retransmitted packet or an unnecessary retransmitted packet.

United States Patent No. 6,370,599 to Anand et al., which is cited to show several properties of a NIC.

United States Patent No. 6,721,872 to Dunlop et al., which is cited to show examples of how and where field programmable gate arrays can be found.

United States Patent No. 6,064,649 to Johnston, which is cited to show properties of a NIC.

United States Patent No. 5,450,394 to Gruber et al., which is cited to show a delay monitoring of telecommunications networks.

United States Patent No. 5,878,032 to Gruber et al., which is cited to show a delay monitoring of telecommunications networks.

United States Patent No. 6,717,917 to Weissberger et al., which is cited to show a method of determining real-time data latency.

United States Patent No. 6,625,447 to Rossmann, which is cited to show using TCP over UDP.

United States Patent No. 6,430,409 to Rossmann, which is cited to show a case where TCP can be used instead of UDP.

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United States Patent No. 6,621,834 to Scherpbier et al., which is cited to show another case where TCP can be used instead of UDP.

57. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

58. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

59. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christian La Forgia whose telephone number is (703) 305-7704. The examiner can normally be reached on Monday thru Thursday 7-5.


60. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz Sheikh can be reached on (703) 305-9648. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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61. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christian LaForgia
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Art Unit 2131

clf


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